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# Dairy Farmers' Valuation of Cooperative Market Security



## Abstract

### Dairy Farmers' Valuation of Cooperative Market Security

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This paper presents a methodology for quantifying the value of market security to an individual farmer. The income distribution associated with belonging to a cooperative is considered to have a lower variance than when selling to a proprietary handler. A farmer makes the choice between the cooperative and the proprietary handler based on individual risk preference. The amount a risk-averse farmer is willing to accept as compensation for facing a more risky distribution was calculated by employing Meyer's technique for choosing between two stochastic functions. Several simulations were presented to demonstrate the magnitude and sensitivity of the measure.

**Keywords:** Cooperatives, market security, risk, stochastic dominance with respect to a function

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## Preface

This study represents a new attempt at quantifying the value of market security provided by milk marketing cooperatives to dairy farmers. In various opinion surveys, member-producers of dairy cooperatives gave high marks for the secure cooperative market. It was the most important reason for the majority of farmers to market milk through cooperatives.

The value of market security is abstract and is elusive to quantify. Yet, its quantification is very important for farmers to understand the value of cooperative membership. When farmers have better knowledge of this value, they may be more willing to join cooperatives and be more supportive of their cooperative. This research was done under a cooperative research agreement between Agricultural Cooperative Service and The Pennsylvania State University.

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## Highlights

The guaranteed market offered by a cooperative makes the farmer's income probability function more reliable (less risky). While a farmer selling to a proprietary handler is more likely to lose a market, the farmer often receives a higher price. Thus, the range of expected incomes facing a farmer selling to a proprietary handler will probably be greater than that of a farmer who belongs to a cooperative. The theoretical value of market security is related to the difference in the income probability distribution that the farmer would face as a cooperative member versus selling to a proprietary handler.

A methodology for quantifying the value of market security to an individual farmer was developed. The benefit of market security to a cooperative member was calculated as the amount the risk-averse farmer is willing to accept as compensation for facing a more risky income distribution when selling milk to an alternative proprietary handler. A farmer who is paid an amount equal to the farmer's willing-to-accept (WTA) amount is hypothetically indifferent to marketing through a proprietary handler or receiving the WTA amount versus belonging to a cooperative with a more secure market.

An example was used to show that a reasonably conservative farmer (i.e., one with a moderate risk-aversion level) would give up \$235 to \$476 annually to avoid facing a more risky income distribution. Farmers who had greater desire to avoid risk required more significant WTA amounts. Farmers assumed to be the most highly averse to risky income situations were estimated to be willing to pay \$2,050 to \$2,760 for market security.

The WTA amount was calculated by employing Meyer's technique for choosing between two stochastic functions. Stochastic dominance with respect to a function was used first to rank income distributions and then to derive the amount that a farmer would accept to be indifferent to 2 distributions. The methodology could be used to obtain actual estimates of the benefit of market security provided by milk marketing cooperatives when using actual income distributions resulting from marketing milk through a cooperative versus a proprietary handler.



# Dairy Farmers' Valuation of Cooperative Market Security

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A farmer's decision on whether to market milk through a cooperative or through a proprietary handler involves carefully weighing costs and benefits. Many dairy farmers belong to milk marketing cooperatives which allow them to take advantage of economies of scale in milk marketing, integrate forward into milk packaging and processing, and increase their bargaining power. Cooperative membership normally allows dairy farmers more control over the business that markets their product. Further, the presence of an assured market is often cited by dairy farmers as being the most common reason for cooperative membership (4). Cooperative promotional literature often indicates that cooperatives can offer a guaranteed market far into the future while a proprietary handler cannot.

A dairy farmer is particularly vulnerable to short-term opportunistic behavior of milk handlers, because production costs are sunk at the time of the transaction and milk is highly perishable (11). Provision of secure and long-term access to output markets is a main advantage of the cooperative over a proprietary handler who does not offer a guaranteed market to the same degree as a cooperative. A 1984 national survey of milk marketers reported that 95 percent of the surveyed cooperatives guaranteed a market for their dairy farmers versus 51 percent of the proprietary processors (10). Both the processors and grade A dairy farmers rated market guarantees as being very important. These results were consistent with a 1980 study where 87 percent of the cooperative cheese plants surveyed guaranteed a daily market for farmers' milk, versus only 76 percent of the proprietary firms (2).

In times of milk surplus, a proprietary handler often "cherry picks." In this practice, producers who are small, who are inconveniently located, and/or who have other non-profitable characteristics are dropped as customers. Besides cherry picking, a proprietary handler may go out of business, leaving all its former customers without a milk market. Since most individual farmers do not have the capacity to process or store their milk, a farmer that does not have a market often will have to sell milk at a distressed price or even dump milk until a new market is obtained. Cooperatives may also go out of business but the member-controlled nature of the business allows members to know in advance about the difficulties, giving them advance warnings to find other outlets for their milk. Some proprietary handlers who are going bankrupt continue to collect milk and farmers are not informed until their checks are returned for insufficient funds or the bankruptcy is announced. The protection that cooperatives offer against exploitation by milk handlers may be particularly valuable if a dairy farmer is not diversified into other enterprises.

Thus, access to a market is one of the major benefits a farmer must weigh against the costs of cooperative membership. Despite the acceptance of market security as a primary cooperative benefit, the economic value of market security "defies quantification" (6). This paper develops a theoretical framework for quantifying the value of market security by utilizing a willingness to accept (or pay) measure. An example is used to demonstrate the applicability of the theoretical measure.

## Value of Cooperative Market Security

Many dairy farmers market milk through cooperatives for reasons of market security. While a farmer selling to a proprietary handler is more likely to lose a market, the farmer often receives a higher price (4). Thus, the range of incomes expected by a farmer selling to a proprietary handler will probably be greater than that of a farmer who belongs to a cooperative. The guaranteed market offered by a cooperative makes the farmer's income probability function more reliable or less risky. The income probability distribution that the cooperative member faces is thus assumed to have a lower variance than the distribution offered by a proprietary handler. The theoretical value of market security must then be related to the difference in the income probability distribution that the farmer would face as a cooperative member versus selling to a proprietary handler.

Consider two hypothetical dairy farmers who are located adjacent to each other. Their scale is about the same as is their management and labor input. The income distributions from selling to a dairy cooperative or a proprietary handler for each farmer are essentially identical. Each farmer makes the marketing choice based on the same set of distributions. Yet one farmer may choose the cooperative and the other the proprietary handler due to differences in individual risk preferences. The farmer who is more risk-averse will most likely choose to belong to the cooperative, giving more weight to the lower variance in income than the less risk-averse farmer.

Suppose the expected value of each income distribution is the same, \$24,200, from both the cooperative and proprietary handler in the example shown in table 1 and fig. 1. If a farmer were neutral to the level of risk associated with either choice, the farmer would be indifferent to the two distributions. Thus, market security would have no value to this individual. However, the income distribution around the average income (i.e., the standard deviation) for a cooperative member is \$1,483, while for a farmer selling to a proprietary handler it is \$3,701 in this hypothetical example.

The benefit of market security can be calculated as the difference between the higher but riskier income distribution from selling to a proprietary handler and the lower but more secure income distribution from marketing through a dairy cooperative. The difference is called a farmer's willing-to-accept (WTA) amount—an amount to induce the farmer to be indifferent to selling to a proprietary handler with higher and riskier expected income, and to marketing through a cooperative with a lower but more secure expected income. Depending on the farmer's risk-aversion level, the willing-to-accept amount can be different (table 2).

Figure 1—Cumulative Probability Function

Cumulative probability

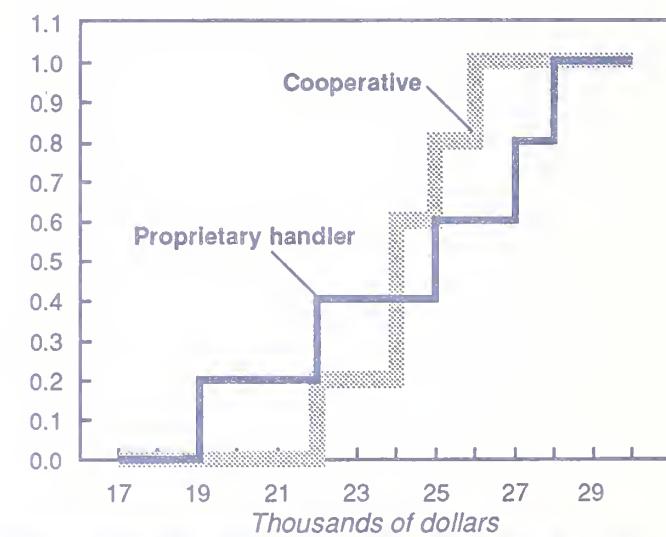


Table 1—A farmer's hypothetical income distributions when marketing milk through a cooperative and a proprietary handler

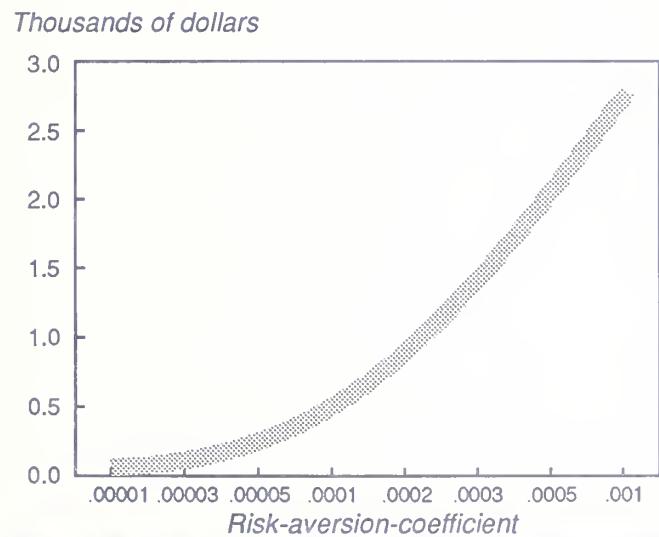
Outcome	Cooperative Income Distribution (C)	Proprietary Handler Income Distribution (H)
	Dollars	Dollars
1	22,000	19,000
2	24,000	22,000
3	24,000	25,000
4	25,000	27,000
5	26,000	28,000

Assuming a conservative estimate of a farmer's risk-aversion level (risk coefficient) between .00005 and .0001, the farmer would give up \$235 to \$476 to avoid facing a more risky income distribution.

Higher levels of risk aversion result in more significant WTA amounts (fig 2.). Farmers assumed to be the most highly risk-averse were estimated to be willing to pay \$2,050 to \$2,760 for market security under the hypothetical income distributions.

The example presented in this paper is based on the theoretical framework presented below. Further research is needed to estimate actual income distributions resulting from marketing milk

**Figure 2—Willing-to-Pay Values for Market Security**



**Table 2—Estimates of farmers' willing-to-accept (WTA) amount at different intervals of risk-aversion**

Coefficient Interval	Low WTA Estimate		High WTA Estimate	
	Dollars			
0.00001 to 0.00003	\$46		\$139	
0.00003 to 0.00005	\$139		\$235	
0.00005 to 0.0001	\$235		\$476	
0.0001 to 0.0002	\$476		\$953	
0.0002 to 0.0003	\$953		\$1,388	
0.0003 to 0.0005	\$1,388		\$2,050	
0.0005 to 0.001	\$2,050		\$2,760	

through a cooperative versus a proprietary handler. The methodology could then be used to obtain actual estimates of the benefit of market security provided by milk marketing cooperatives.

## Theoretical Framework

A measure for the value of a secure market must incorporate risk preferences in the evaluation of alternative income distributions. Several techniques are available in the literature to rank income distributions. First degree stochastic dominance is a simple, commonly used efficiency criterion. First degree stochastic dominance states that decision-makers prefer more to less. The relevant restriction on the expected utility function  $u(x)$  is  $u'(x)>0$ . Second degree stochastic dominance further restricts  $u(x)$  such that  $u''(x)<0$  (all decisionmakers have concave utility functions). First and second degree stochastic dominance are simple to apply yet rarely result in complete orderings of distributions (5). Elicited expected utility functions can be used as ordering criteria. These functions are normally obtained by survey methods presenting respondents with many choices among distributions. Alternate distributions can then be ordered precisely. However, the accuracy of elicited functions limits the reliability and applicability of rankings. This report used a method called stochastic dominance with respect to a function to provide ordering of income distributions.

Stochastic dominance with respect to a function utilizes the Pratt-Arrow absolute risk-aversion coefficient. This coefficient is defined as  $r(x)=-u''(x)/u'(x)$  where  $x$  in this case is income and  $u$  is a von Neumann-Morgenstern utility function. Values of  $r(x)$  are "simply local measures of the degree of concavity or convexity of a utility function" (5). A value of  $r=0$  represents an individual with constant marginal utility of income and absolute risk neutrality. This individual would choose between two income distributions based only on expected income. The coefficient is positive for all risk-averse decision-makers (declining marginal utility of income) and a higher value indicates a greater degree of risk-aversion.

Stochastic dominance with respect to a function requires only the assumption that the farmer's absolute risk-aversion coefficient is within an upper and lower bound. The effectiveness of this method depends upon the width of the intervals being used. Several researchers (13, 5, 12) have researched feasible upper and lower bounds for ordering different income distributions. These researchers have generally defined risk neutrality according to risk coefficients of -0.0001 to 0.0001. A lower bound on strong risk aversion has been specified as low as 0.0002 and as high as 0.001. Raskin and Cochran (8), however, have demonstrated the sensitivity of marginal utility to risk coefficients and suggested that the intervals utilized by previous work may have been too wide. The intervals used in the simulations presented in this paper are based on the implications of Raskin and Cochran's results.

Much literature relates to stochastic dominance with respect to a function but of particular interest is previous work by Bosch and Eidman (3) who used this method to choose between an income distribution with and without information. They then estimated an amount that would make the two distributions stochastically equal. This is relevant because market security can be viewed as a similar problem. The amount that would make the farmer indifferent to the income distribution from a relatively guaranteed market, and that from a more uncertain market, is a measure of the value of market security.

Consider the previously mentioned example of a farmer choosing between two income distributions each with five possible outcomes. Distribution C is associated with a farmer marketing milk through a cooperative and distribution H is associated with a farmer shipping to a proprietary handler. The hypothetical distributions, with each outcome having an equal probability of occurrence, were shown in table 1. The expected values of each income distribution is the same, \$24,200, however the standard deviations are \$1,483 for C and \$3,701 for H.

Define the cumulative distribution function (CDF) of distribution C as  $C(x)$  and the CDF of distribution H as  $H(x)$ . Following Meyer (7), the solution procedure for ordering income distributions identifies the utility function which minimizes:

$$\int_{-\infty}^{\infty} [H(x) - C(x)]u'(x)dx \quad (1)$$

subject to:

$$r_1(x) \leq -u''(x)/u'(x) \leq r_2(x). \quad (2)$$

If (1) is positive for a given set of decisionmakers, then members of this set unanimously prefer  $C(x)$  to  $H(x)$ . If (1) is zero, then neither distribution is unanimously preferred since an individual in the set of decisionmakers is indifferent to the distributions. If (1) is negative,  $C(x)$  is not unanimously preferred to  $H(x)$  and a new equation

$$\int_{-\infty}^{\infty} [C(x) - H(x)]u'(x)dx \quad (3)$$

is minimized subject to the same constraint. If (3) is positive, then  $H(x)$  is unanimously preferred to  $C(x)$  for all decisionmakers with absolute risk coefficients in the interval  $[r_1, r_2]$ . If (3) is negative, then this method cannot order the distributions.

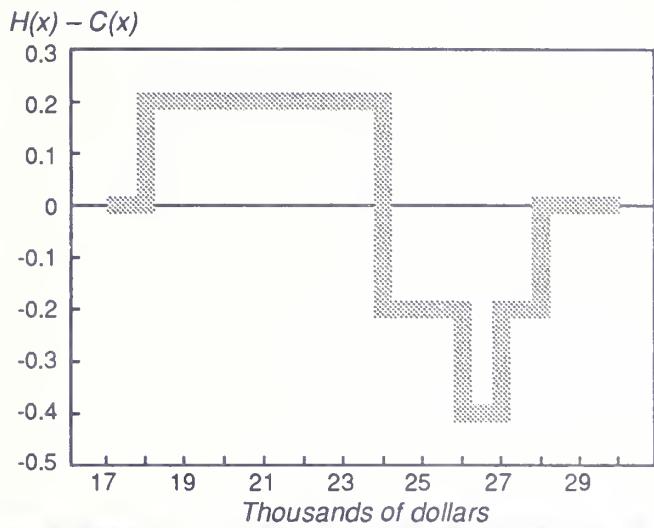
King and Robison demonstrate that (1) and (3) are actually the differences in expected utility associated with the two distributions. Individuals prefer the distribution that yields the highest expected utility based on their subjective risk analysis. If risk preferences are exactly defined, distributions can be completely ordered. Since stochastic dominance with respect to a function defines risk preferences according to coefficient intervals, a complete ordering is not always ensured.

Meyer, however, developed an optimal control methodology for ordering distributions using this method. His theorem states that

$$r = \begin{cases} r_1(x) & \text{if } \int_{-\infty}^{\infty} [H(x) - C(x)]u'(x)dx < 0 \\ r_2(x) & \text{if } \int_{-\infty}^{\infty} [H(x) - C(x)]u'(x)dx \geq 0. \end{cases} \quad (4)$$

For example, consider a farmer facing the distributions presented above whose risk coefficient is within the closed interval of  $r_1 = 0.00005$  and  $r_2 = 0.0001$ . To solve the optimal control problem set up by Meyer, a negative exponential form of utility,

**Figure 3—Cumulative Distribution**



$u(x) = -e^{-rx}$  can be assumed. This provides constant upper and lower bounds on  $r$ . The function  $[H(x) - C(x)]$  is illustrated in fig. 3. The solution procedure works backwards from the right-hand side of fig. 3. Since the objective function has a value of 0 above \$28,000, the upper limit of integration becomes \$28,000. An intermediate value of the objective function is calculated each time the value of  $[H(x) - C(x)]$  changes. According to the calculations dictated by Meyer, the control value is initially 0.00005. The first interval of integration is \$27,000 to \$28,000. The value of the objective function over this range is

$$\begin{aligned} & \int_{27,000}^{28,000} [H(x) - C(x)] u'(x) dx \quad (5) \\ &= \int_{27,000}^{28,000} (-1/5)(0.00005) e^{-0.00005x} dx \\ &= -0.002529. \end{aligned}$$

Since this value is negative, the control value remains at 0.00005. The integral from \$26,000 to \$27,000 is  $-0.005317$  and the integral from \$24,000 to \$26,000 is  $-0.005732$ . The intermediate value of the objective function from \$24,000 to \$28,000 is  $-0.013578$ .

The final non-zero interval of  $[H(x) - C(x)]$  is \$19,000 to \$24,000. The intermediate value of the objective function over this range is 0.021075. Since this is greater in absolute value than  $-0.013578$ , the control value will change somewhere between \$19,000 and \$24,000. Iterations indicate the objective function changes sign at approximately \$19,935. Thus, 0.0001 is the control value from \$19,935 to \$19,000. The intermediate value of the objective function integrated over this interval is 0.002670. Since the value of the minimized objective function is positive,  $H(x)$  is preferred to  $C(x)$  by all decisionmakers whose risk-aversion coefficient is always between 0.00005 and 0.0001. Further, the utility function that minimizes the objective function is defined by:

$$r = \begin{cases} 0.00005 & \text{when } x \geq \$19,935 \\ 0.0001 & \text{when } x < \$19,935. \end{cases} \quad (6)$$

Using the risk coefficient defined by (6), the difference in expected utility between the two distributions is minimized. Since  $H(x)$  is preferred to  $C(x)$  when (1) is minimized,  $H(x)$  will be preferred to  $C(x)$  according to all definitions of risk coefficients within the specified interval.

### Willing-to-Accept (or Pay)

When the value of (1) is zero, an individual in the relevant risk-aversion coefficient range is indifferent to the two distributions. The WTA amount is calculated as the amount of money added to each possible outcome in distribution  $H$  such that the overall value of the objective function becomes zero. When the value of (1) is zero, a value for (3) must also be calculated. When the value of (3) is also zero, an individual in the relevant risk-coefficient range is indifferent to the two distributions. An individual indifferent to the two distributions would consider the expected utility of each distribution to be equal. Estimates of WTA can be obtained by solving for  $\varepsilon_1$  and  $\varepsilon_2$  in the following:

$$\int_{-\infty}^{\infty} [C(x) - H(x + \varepsilon_1)] u'(x) dx = 0 \quad (7)$$

$$\int_{-\infty}^{\infty} [H(x + \varepsilon_2) - C(x)] u'(x) dx = 0. \quad (8)$$

Rewrite (7) and (8) as follows

$$\int_{-\infty}^{\infty} [C(x)]u'(x)dx - \int_{-\infty}^{\infty} [H(x+\varepsilon_1)]u'(x)dx = 0 \quad (9)$$

$$\int_{-\infty}^{\infty} [H(x+\varepsilon_2)]u'(x)dx - \int_{-\infty}^{\infty} [C(x)]u'(x)dx = 0. \quad (10)$$

Note that (9) and (10) are differences between the expected utilities of the two distributions. These equations can also be written as

$$\int_{-\infty}^{\infty} [c(x)]u(x)dx - \int_{-\infty}^{\infty} [h(x+\varepsilon_1)]u(x)dx = 0 \quad (11)$$

$$\int_{-\infty}^{\infty} [h(x+\varepsilon_2)]u(x)dx - \int_{-\infty}^{\infty} [c(x)]u(x)dx = 0. \quad (12)$$

where  $h(x)$  and  $c(x)$  are probability density functions.

The income probability distributions presented in the previous example are discrete. (11) and (12) can be written in discrete form as:

$$\sum_{j=1}^m [c(x_j)]u(x_j) - \sum_{i=1}^n [h(x_i+\varepsilon_1)]u(x_i) = 0 \quad (13)$$

$$\sum_{i=1}^n [h(x_i+\varepsilon_2)]u(x_i) - \sum_{j=1}^m [c(x_j)]u(x_j) = 0. \quad (14)$$

In the example  $m=n$  but the WTA expression is developed for the general case of  $m \neq n$ .

By assuming the negative exponential form of the utility function, (13) can be rewritten as

$$\sum_{j=1}^m [\frac{1}{m}] [-e^{-rx_j}] - \sum_{i=1}^n [\frac{1}{n}] [-e^{-r(x_i+\varepsilon_1)}] = 0 \quad (15)$$

and solving for  $\varepsilon_1$

$$\varepsilon_1 = (-1/r) * \ln \left[ \frac{\left( \sum_{j=1}^m -e^{-rx_j} \right) (n)}{\left( \sum_{i=1}^n -e^{-rx_i} \right) (m)} \right] \quad (16)$$

A similar expression defines  $\varepsilon_2$  except that the other bound on the risk coefficient would be used.

Thus, two estimates for willing-to-accept are obtained by this procedure.

The validity of (16) is contingent on the value of the objective function not changing sign and thus the same control value being used. If this is not the case, the simplified form presented in (16) could not be used and (11) and (12) would be solved by iterating the WTA value until equality holds.

Equation (16) was used to obtain WTA values for the simulation presented in table 2. First,  $r$  is 0.00005 and calculations yield a value of \$235 for WTA. Using an  $r$  value of 0.0001, a value of \$476 is obtained. The lower bound value of  $r$  gives the lower estimate of WTA and the upper bound value of  $r$  results in the higher estimate of WTA.

The sensitivity of WTA is explored by defining different intervals of risk coefficients. The WTA estimates become relatively significant when  $r$  is in the range of values used by previous researchers as shown in table 2 (12, 5).

In summary, a solution procedure for ordering different income distributions was determined by differences in the expected utility associated with the two distributions. The risk preference of an individual affects the farmer's utility function and therefore his or her choice of distributions. The amount of money added to the more risky income distribution (noncooperative market) that would have the same utility to the farmer as that from a relatively guaranteed market (cooperative market) is a measure of the value of market security provided by cooperatives.

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# Technical Appendix

## Determining Efficient Distributions Using Stochastic Dominance with Respect to a Function

The function  $[H(x) - C(x)]$  is presented in figure 3. Since the objective function has a value of 0 above \$28,000, the upper limit of integration is in effect \$28,000. A value for the objective function is calculated each time the value of  $[H(x) - C(x)]$  changes. Thus, the first interval of integration is \$27,000 to \$28,000. The initial value of the control variable is 0.00005 according to (4). The value of the objective function over this range is

$$\begin{aligned} & \int_{27,000}^{28,000} [H(x) - C(x)] u'(x) \\ = & \int_{27,000}^{28,000} (-1/5)(0.00005) e^{-0.00005x} \\ = & (-1/5) \{ [20,000 - 20,000(e^{-0.00005 \cdot 28,000})] \\ & - [20,000 - 20,000(e^{-0.00005 \cdot 27,000})] \} \\ = & -0.002529 \end{aligned}$$

Since this value is negative, the control variable remains at 0.00005. The next interval as seen in figure 3 is \$26,000 to \$27,000

$$\begin{aligned} & \int_{26,000}^{27,000} [H(x) - C(x)] u'(x) \\ = & \int_{26,000}^{27,000} (-2/5)(0.00005) e^{-0.00005x} \\ = & (-1/5) \{ [20,000 - 20,000(e^{-0.00005 \cdot 27,000})] \\ & - [20,000 - 20,000(e^{-0.00005 \cdot 26,000})] \} \\ = & -0.005317 \end{aligned}$$

The total value of the objective function from \$26,000 to \$28,000 is -0.007846. The next interval is \$24,000 to \$26,000

$$\int_{24,000}^{26,000} [H(x) - C(x)] u'(x)$$

$$\begin{aligned} = & \int_{24,000}^{26,000} (-1/5)(0.00005) e^{-0.00005x} \\ = & (-1/5) \{ [20,000 - 20,000(e^{-0.00005 \cdot 26,000})] \\ & - [20,000 - 20,000(e^{-0.00005 \cdot 24,000})] \} \\ = & -0.005732 \end{aligned}$$

The value of the objective function is now -0.013578. The final interval of  $[H(x) - C(x)]$  is \$19,000 to \$24,000. The value of the objective function over this range is

$$\begin{aligned} & \int_{19,000}^{24,000} [H(x) - C(x)] u'(x) \\ = & \int_{19,000}^{24,000} (1/5)(0.00005) e^{-0.00005x} \\ = & (1/5) \{ [20,000 - 20,000(e^{-0.00005 \cdot 24,000})] \\ & - [20,000 - 20,000(e^{-0.00005 \cdot 19,000})] \} \\ = & 0.021075 \end{aligned}$$

Since this value is greater in absolute value than -0.013578, the control variable should have changed value between \$19,000 and \$24,000. Iterations were conducted until the zero point of the objective function was located

$$\begin{aligned} & \int_{19,935}^{24,000} [H(x) - C(x)] u'(x) \\ = & \int_{19,935}^{24,000} (1/5)(0.00005) e^{-0.00005x} \\ = & (1/5) \{ [20,000 - 20,000(e^{-0.00005 \cdot 24,000})] \\ & - [20,000 - 20,000(e^{-0.00005 \cdot 19,935})] \} \\ = & 0.013577 \end{aligned}$$



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Thus, the value of the objective function changes sign at approximately \$19,935. From this value to \$19,000, (4) indicates that the other risk-coefficient bound (0.0001) is the control variable. The value of the objective function integrated over this interval is

$$\begin{aligned}
 & \int_{19,000}^{19,935} [H(x) - C(x)] u'(x) \\
 = & \int_{19,000}^{19,935} (1/5)(0.0001)e^{-0.0001x} \\
 = & (1/5) \{ [10,000 - 10,000(e^{-0.0001 \cdot 19,935})] \\
 & - [10,000 - 10,000(e^{-0.0001 \cdot 19,000})] \} \\
 = & 0.002670
 \end{aligned}$$

The total value of the objective function is 0.002669. Since this value is positive, the decision rule developed by Meyer indicates that  $H(x)$  is preferred to  $C(x)$  by all decisionmakers whose risk coefficient is always between 0.00005 and 0.0001.

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Agricultural Cooperative Service (ACS) provides research, management, and educational assistance to cooperatives to strengthen the economic position of farmers and other rural residents. It works directly with cooperative leaders and Federal and State agencies to improve organization, leadership, and operation of cooperatives and to give guidance to further development.

The agency (1) helps farmers and other rural residents develop cooperatives to obtain supplies and services at lower cost and to get better prices for products they sell; (2) advises rural residents on developing existing resources through cooperative action to enhance rural living; (3) helps cooperatives improve services and operating efficiency; (4) informs members, directors, employees, and the public on how cooperatives work and benefit their members and their communities; and (5) encourages international cooperative programs.

ACS publishes research and educational materials and issues *Farmer Cooperatives* magazine. All programs and activities are conducted on a nondiscriminatory basis, without regard to race, creed, color, sex, age, marital status, handicap, or national origin.